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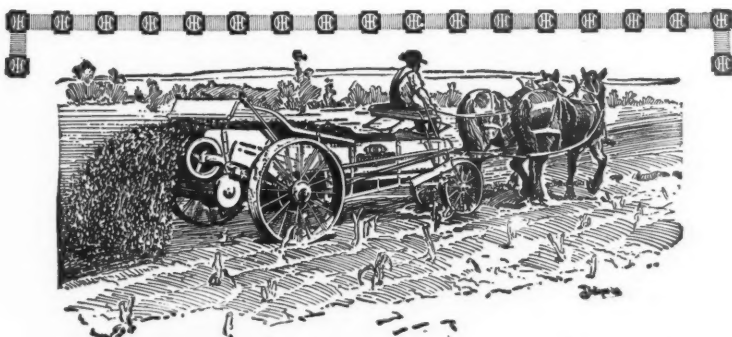
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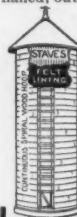
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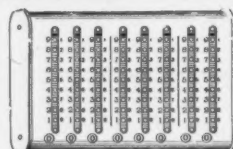
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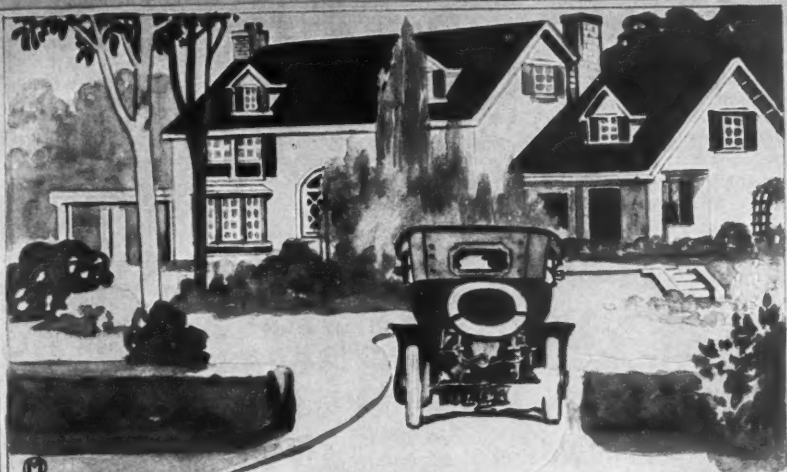
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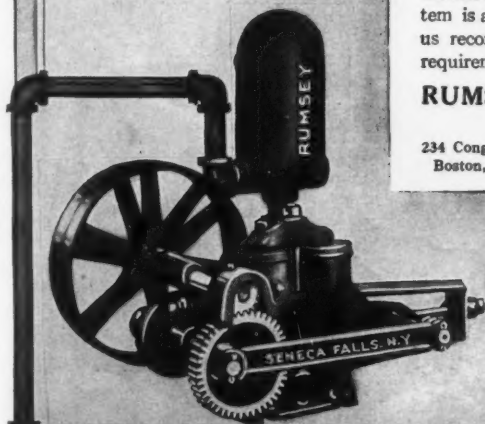
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The Cornell Countryman

Vol. 11

APRIL, 1914

No. 7

RETIREMENT OF PROFESSOR JOHN HENRY COMSTOCK

By S. H. Gage

Professor of Histology and Embryology, Emeritus; Cornell University

AT THE close of the present college year Professor John Henry Comstock, head of the department of Entomology, will retire at the age of 65. It seems difficult for his colleagues and students to conceive of the department without Professor Comstock at its head, for he is its creator and has been its inspiration for over forty years.

In 1869 he came to the university with keen interest in the study of insects, and with the expectation, from the university announcement, that he would find inspiring teachers, and those specializing in entomology. He found the inspiring teachers, and the sympathy and encouragement he desired, but he himself became the specialist in entomology.

It came about in this way: In 1872, thirteen students in natural history and agriculture petitioned the University Faculty for a course of lectures in entomology to be given by J. H. Comstock. Among the thirteen are found the names of David Starr Jordan, William R. Dudley and several others who have since won renown. Professor Wilder, the head of the department of zoology, in which department the course was to be given, strongly favored the petition, and the Faculty authorized the course. It was given—one lecture a week with field work during the spring term of 1872.

The plan of this course has never been departed from in all the splendid development of his department. There have been lectures for the general survey of the subject and the discussion of principles, but going with the lectures have been field and laboratory-work in which the student is brought in direct personal contact with nature herself, and can see the evidence with his own eyes, and learn to be an independent observer and thinker.

Mr. Comstock did not stop with the opportunities and facilities available at Ithaca, but sought those found in the older institutions of our own and other lands. Very early in his career (1872) he spent the summer in study with the distinguished entomologist, Dr. Hermann Hagen, of the Agassiz Museum of Comparative Zoology at Harvard University. Needless to say he won the respect and friendship of Dr. Hagen, and was given the freest use of the priceless collections in the museum. Later (1875) he studied at Yale University, and still later (1888-1889) at the University of Leipzig. He has used every means in his power to prepare himself to make his department what it should be. In the words of one who knows him well, "He has never ceased to grow, and to make his department grow with him"; and this seems to be as true to-day as it did two decades ago.

In 1876 he was made assistant professor and his duties were enlarged to include general invertebrate zoology. In 1882 he was elected to a full professorship, and in 1909 there came under his supervision as an outgrowth of his department the subject of general biology and in 1912 that of nature study.

If we follow his eventful career since those first lectures in 1872 we find that he has given personal instruction to more than five thousand students. More than fifty of his advanced students have become state or national entomologists or professors of entomology or zoology in various colleges and experiment stations. Besides these, a very large number of teachers in natural history and investigators in all departments of science look back to his instruction with gratitude for the true and inspiring view of nature which he gave them.

As stated above, David Starr Jordan was one of the petitioners for that first course which Mr. Comstock gave. Twenty years later when it fell to the lot of Dr. Jordan to establish and preside over a great university on the Pacific slope, he turned again to Professor Comstock to lay the foundation of a department of entomology for the Stanford University of the same character and ideals with which he had so richly endowed the one at Cornell. Professor Comstock entered upon this work with his accustomed enthusiasm and was non-resident professor in Stanford from its beginning in 1891 to 1900, spending his vacation term at Stanford. Judging by the strength and vigor of Stanford's entomological department his work partook of the same productive spirit there as here.

In his work in the larger world outside the University, he never turned a deaf ear to the farmer and the horticulturist when they appealed to him for help in their struggles with insect pests. When the opportunity came to him to serve the whole country as United States Entomologist (1879-1881), the broad views he had gained

as a teacher and an investigator, and his extensive knowledge of the conditions and difficulties of the agricultural districts of the country, enabled him to inaugurate a far-sighted and comprehensive policy for the development of the work of the United States through its department of entomology in furnishing information about injurious insects and giving aid in helping to suppress them. This program has been carried out and extended in a most efficient manner by one of his students, L. O. Howard, '78.

Turning from the work he has done for the University and for the country to the still larger field where one's work is for the whole world, Professor Comstock's bulletins and monographs upon various phases of insect structure and life, and his beautifully written and illustrated books upon entomology, make an exhibit which is most honorable.

Naturally, he became identified with our own national societies of science, and entered into the work done by them in zoology and especially in entomology and has been honored by the presidency of several of them. That he is also appreciated by his colleagues abroad is evidenced by the fact that he has been made a member of the Entomological Society of France, honorary member of the Entomological Society of Belgium, and honorary fellow of the Entomological Society of London.

In 1912 he was made the representative of Cornell University at the celebration of the 250th anniversary of the Royal Society of London. During this same year he was appointed by the Entomological Society of London to represent that society at the 100th anniversary of the Academy of Natural Sciences of Philadelphia.

As a man and a citizen Professor Comstock has always enjoyed the esteem and confidence of his colleagues and of the community. No one is ever in doubt where he stands on all questions of plain honesty or high principle.

No home has given a warmer hospitality and few if any have been so

generous in that hospitality as his. Students from every corner of our own broad land, and from every continent, when they think of the University always couple with those thoughts this home where the spirit of the home was exemplified and where human sympathy and friendliness were in the very atmosphere.

When in 1872 he gave the first course of lectures, he was a student assistant, but the following year was made instructor by the university trustees. For years afterward as instructor and assistant professor he was alone in the department, giving all the lectures and personally directing all of the laboratory and field work. Room and facilities were meagre;

but now after more than forty years when he retires from active work in the instruction, the department which he has created has a magnificent material equipment, and a staff of five professors, five assistant professors, two instructors, sixteen assistants, one fellow, one librarian and one curator, (31 in all).

Fortunately, while he is to lay aside the burdens of teaching and administration in the department, he will remain in our midst, bringing to completion the researches upon which he is engaged and the books which are already planned; and we feel sure that there will ever remain his friendly, helpful and sympathetic attitude toward both colleagues and students.

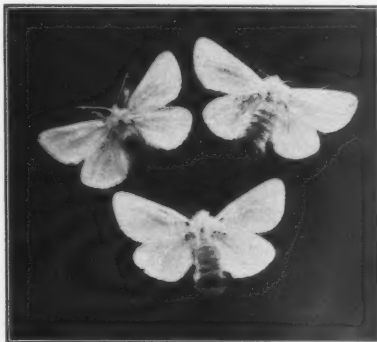
THE NATIONAL QUARANTINE LAW AGAINST INSECT PESTS AND PLANT DISEASES

By Glenn W. Herrick

Professor of Economic Entomology, Cornell University

IN 1911, Mr. C. L. Marlatt, in speaking of a national law to prevent the importation of injurious insects and plant diseases, said, "The United States is the only great power without protection from the importation of insect-infested or diseased plant stock." It is true that up to the first day of October, 1912, most of the ports of entry in the United States were open to the incoming of any and all kinds of plants without a question as to what injurious insects or diseases there might be on such stock. As a result, we have been struggling for years with such notorious pests as the San José scale, codling moth, Hessian fly, imported cabbage worm, Angoumois grain moth, Croton bug, horn fly of cattle, asparagus beetles, and other old offenders. The pests just named were introduced into this country from European countries many years ago and all of them came with plants or animals that were transported in ships and landed at our ports of

entry. Nor is this all! Within the last two decades, prior to the passage of the national quarantine law, there came into the United States a few of



BROWN TAIL MOTHS

the worst insect pests and plant diseases our country has ever known. We refer to the Mexican cotton boll weevil, the brown-tail moth, the

chestnut bark disease, and the white-pine blister rust.

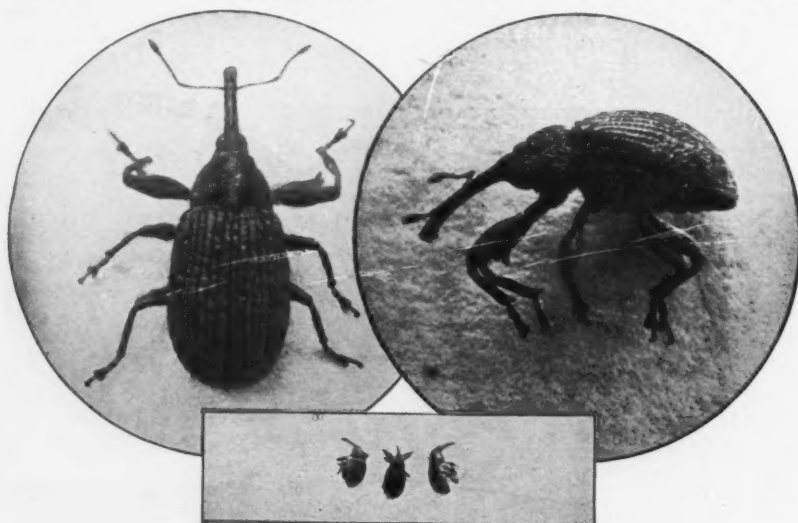
LOSSES CAUSED BY INSECTS

It seems safe to say that at least half of the worst insect pests in this country have been imported from foreign countries. The annual losses due to insect pests in the United States alone have been conservatively estimated to be a round billion dollars. Probably half of this loss can be safely attributed to our imported pests.

highways and thus check their spread. For several years Congress appropriated a quarter of a million dollars to fight the Mexican cotton boll weevil and other cotton insects in the South.

ATTEMPTS TO SECURE A QUARANTINE LAW

The need of a national quarantine law has been recognized for many years and active attempts were made to secure such a law for at least a



MEXICAN COTTON BOLL-WEEVIL

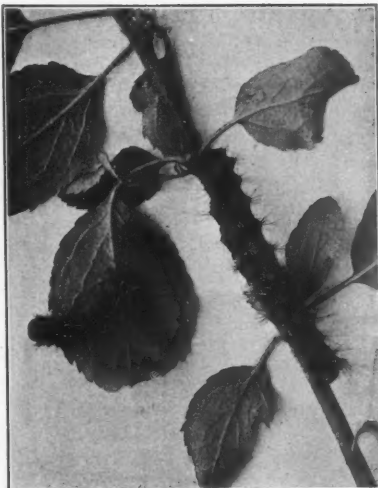
Undoubtedly much of this might have been prevented had our national law come earlier. To the actual losses caused by these pests must always be added the cost of fighting them. For example, it is estimated that it would cost four million dollars annually to spray the apple trees in the United States for the codling moth. Spraying for the San José scale costs an immense amount of money every year in time, labor, and materials. The national government is appropriating \$300,000 a year for fighting the gypsy and brown-tail moths in New England merely by attempting to control them along the

dozen years before it was finally passed. The immediate danger that led to the final effort to secure legislation was the discovery in 1909 of the large importation into the United States on nursery stock and the wide distribution of nests of the brown-tail moth larvae. During 1909, 7000 nests of the brown-tail moth containing probably 3,000,000 larvae were found on shipments of nursery stock into New York State alone. During the two years of 1909 and 1910 nursery stock infested with nests of the brown-tail moth and occasional egg masses of the gypsy moth were carried into 22 different states of the Union. The

exigencies of the situation called for immediate action and activity in securing legislation became greater than ever.

Unfortunately, the efforts to secure a national quarantine law were opposed year after year by a small body of importing nurserymen. They feared a slight interference with their freedom of business and apparently were not alive to the danger that infested stock might hold for an immense number of people in the different states of the Union. It seems that the total value of imported nursery stock in 1910 was only about \$350,000, slightly more than the National Government was spending on the control of the gypsy and brown-tail moths along the highways of a restricted part of New England.

The principal objection of the nurserymen had been to the provision for the examination of the stock at the port of entry. Their main argument seemed to be that when the stock was once removed from the original packages for examination it could not be satisfactorily repacked. This objection was met by providing for examina-



CATERPILLARS OF THE GYPSY MOTH

tion and inspection at the points of destination by state officials. Undoubtedly, the old doctrine of state's rights played an important role in the objection to federal inspection at ports of entry. Other minor objections were met by modifications, and finally a bill upon which all were agreed was introduced in Congress and was passed and approved August 20, 1912. It took effect on the first day of October, 1912.

PROVISIONS OF THE LAW

In its principal features, the law was modeled on the law governing the importation of domestic animals. A nursery company, in order to import nursery stock, must secure a permit from the Secretary of Agriculture and, in addition, must have such stock accompanied by a certificate of inspection from the proper officials of the country from which the importation is made. These restrictions do not apply to plant products imported for food and for scientific purposes.

Section 2 provides for a careful system of notification to the Government regarding all packages of imported nursery stock. The customs



SAN JOSE SCALE ON PEAR



POTATO WART DISEASE

officers at the different ports of entry must notify the Government of the receipt of stock, the broker or other receiver must send notification, and finally the common carrier must apprise the Secretary of Agriculture before transportation is even begun. Apparently there is little chance to import nursery stock unknown to the Government.

Section 7 makes provision for quarantining against foreign districts which are infested with particularly noxious insects or plant diseases that can not be kept out by inspection. It also provides for an absolute quarantine against particular plant products in foreign districts. For example, the only way to have kept out the chestnut bark disease would have been to have prevented absolutely the importation of any chestnut stock from Japan. Apparently the only way to prevent the introduction of the potato wart disease and white-pine blister rust into this country is to prohibit the importation of seed potatoes and white-pine seedlings from infested districts.

This provision of absolute quarantine provided in Article 7 has been objected to by importing nurserymen. However, it is the only method by which such dangerous diseases and pests can be kept out of the country; and it will not work great hardships to the nurserymen—certainly nothing in comparison with what such diseases and pests, if once allowed to obtain a foothold, might work upon the people of the United States. The Secretary of Agriculture says, "It is not the intention to apply this section except in case of diseases or other dangers which cannot be kept out by the inspection or disinfection. The fears are absolutely groundless that the Department of Agriculture, in enforcing this section would necessarily interfere in any way with legitimate importations of plants, and in those cases where importations carry grave dangers the importers themselves, if honest in their intentions, should be the first to assist in keeping out these dangers." This same provision is in the law relating to the importation of domestic animals and it has worked most satisfactorily there.

Section 8 gives similar power to quarantine against any district in the United States where a new disease or insect pest has gained a foothold until such district has been freed from such disease or insect. For example, it gives power to prohibit the importation of seed potatoes from the State of Oregon to prevent the spread of the potato tuber moth if such quarantine seems wise and necessary in the eyes of the Federal Horticultural Board.

Finally, Section 12 authorizes the Secretary of Agriculture to create what is known as a Federal Horticultural Board to aid him in carrying out the provisions of the law. This Board consists of five members appointed by the Secretary of Agriculture from the Bureaus of Entomology and Plant Industry and the Forest Service, not more than two of whom, however, shall be appointed from any one Bureau or office.

(Concluded on Adv. page 18)

THE STUDENTS' ASSOCIATION OF THE NEW YORK STATE COLLEGE OF AGRICULTURE:

Its Objects and Aims; and a Report of Its Fifth Annual Meeting, February 11, 1914

By E. L. D. Seymour, '09
Garden City, N. Y.

CONSIDERING the many and varied attractions of Farmers' Week, the hundred or more persons who heard Acting Director Stocking open the Fifth Annual Meeting of the Students' Association constituted a very fair attendance. Perhaps before going farther with the report of the meeting I should briefly review the history and aims of this organization, for I am told that the active student body has recently taken the same name for the organization well known to most alumni as the "Agricultural Association", a condition giving rise, perhaps, to a possible misconception.

On the 25th of February, 1909, a meeting was called to consider the formation of a "permanent organization of all the students of the College of Agriculture," and on the next day the plan was carried out, a constitution adopted and officers elected. The objects of the new Association were: "(1) To supply a bond that shall unite all resident and former students of the New York State College of Agriculture. (2) To advance the interests of the College, and (3) to promote country life interests at large."

Of the other specific provisions of the Constitution the following are perhaps worth recalling here:

"This Association shall consist of two parts or divisions—a Resident Division and a Non-Resident Division.

"The Resident Division shall be composed of students registered in the College of Agriculture and members of the staff of the College and Experiment Station. The special purpose of this Division shall be to stimulate student initiative and coöperation and the

spirit of unity and loyalty; to create and maintain a high standard of student life and activity; to advance the standing of the College among the other colleges of Cornell University; and such other duties as may come upon it in its relation to the College, and that may be assigned to it by the Association.

"The Non-Resident Division shall be composed of the former students of the College. Its special responsibility shall be to bring the benefits of the College to the people of the state by example and other means; to make suggestions looking to the increased effectiveness of the work of the College; to support such movements; to promote the welfare of the College and of country life interests at large as the Association may initiate or may determine to aid."

Of the four vice-presidents, it is directed by the Constitution that the first shall be President of the Agricultural Association and shall be charged with the work of the Resident Division; the second "shall be chosen from among the non-resident special students;" the third "from among the resident or former winter course students and shall not be one who has subsequently taken a regular or special course;" and the fourth shall be the editor of the CORNELL COUNTRYMAN, which, also, is designated as the official organ of the Association.

So much for what the Association was designed to be and do. The question to-day is whether the students,—resident and non-resident—are going to back up their action at that time and give their support and membership to

the organization. Thus far, to speak frankly, they have not done so; for, of the six thousand names on the College roll, less than *six and one-half per cent* are paid up members of *their* Association. Surely, it would seem, there is somewhere a lack of interest or appreciation or realization that is creating this obstacle in the path of the progress and effectiveness of the Association.

Work, to be done for the College and the State, by the Students' Association is not wanting; the crystallization of the spirit of the Association in local and county groups of alumni is rich in potential power. And surely the college gives enough to every student that enters and leaves its sphere of influence to deserve the recognition and gratitude that active participation in the work of the organization represents. The Students' Association is a tangible means of keeping in touch with the College interests as a whole. Whether or not you have special fruit-growing, dairying, poultry, or other affiliations, you owe it alike to yourself and to the College to maintain this, general yet centralized medium of contact.

* * *

Resuming my report; Acting Director Stocking outlined clearly and comprehensively the present development of the College, the scope and nature of its past activities and its plans for the immediate future.

President Burritt then reviewed the work and condition of the Association, and called for the usual reports of officers and committees. A phase of the Association's growth was indicated in the brief reports from local or subordinate sections, of which there are now six, located in Wyoming, Chemung, Monroe, Broome, Chautauqua and Suffolk Counties.

The discussion of new business brought up the suggested Student Loan Fund (which was referred to the Executive Committee for consideration and action), the matter of amendments to the Constitution, and the financial condition of the Association. A subscription was started and some two hundred dollars collected with which to

reduce the existing deficit and establish a sinking fund. Later the following amendments were adopted:

§1. Article 5, paragraph 7, was amended to read simply "The Secretary-Treasurer shall have such duties as ordinarily pertain to such office," making possible the election of other than a resident member connected with the College, as formerly required.

§2. Article 6, Section 1 was amended to require an annual due of one dollar (\$1) in addition to the membership fee of two dollars (\$2) already required.

Officers for the ensuing year were recommended by the Nominating Committee and unanimously elected as follows: President, C. H. Royce, Elm Grove, W. Va.; vice-presidents, F. E. Rogers, and F. W. Lathrop, Ithaca; F. H. Richards, Attica; and H. B. Winters, Albany; secretary-treasurer, E. L. D. Seymour, Garden City; members at large of the executive committee, Samuel Fraser, Geneseo; Jared Van Wagenen, Jr., Lawyerville and C. F. Boshart, Lowville.

After adopting the three resolutions given below, the meeting adjourned, to meet informally in the evening in the greenhouses, where light refreshments were served, extemporaneous talks called for by Professor H. H. Wing as impromptu toastmaster, and, on the whole, an altogether pleasant informal reunion enjoyed. It is to be hoped that, whatever changes future years may bring, the latter may remain a permanent feature of the annual meeting.

RESOLUTIONS ADOPTED BY THE STUDENTS' ASSOCIATION OF THE NEW YORK STATE COLLEGE OF AGRICULTURE, AT ITS FIFTH ANNUAL MEETING

Introduced by Professor J. E. Rice:

Recognizing the loyal and exceptionally efficient services of our retiring President, Professor M. C. Burritt, we desire to express the hearty approval and thanks of this Association. *Be it Resolved*, therefore, that a copy of this resolution be included in the minutes of the meeting, and a copy handed to Professor Burritt.

Introduced by Mr. C. H. Royce:

To William A. Stocking, Jr., Acting Director of the New York State College of Agriculture:

The Students' Association of the New York State College of Agriculture, in annual meeting assembled, herewith expresses its gratification at your selection as Acting Director, and desires to express to you its hearty approval of the manner in which you are administering the office of Acting Director, and to assure you of the united and loyal support of its members in your task of solving the grave problems confronting the College, and in continuing the policies laid down by Director Bailey.

Be it resolved, that this resolution be spread on the minutes and a copy be transmitted to Acting Director Stocking.

Introduced by Mr. Samuel Fraser:

At this, the first meeting of the Students' Association since the resignation of Dean Bailey as Director of the State College of Agriculture, it is eminently fitting that some words of appreciation be said of his great services to the State, the Nation, and to this Institution.

For twenty-five years the name of Liberty Hyde Bailey has been linked with agricultural progress in New York State. More than that of any other one man his leadership has given confidence to others and has found a way out of difficulties, and has led the farmers of this State in agricultural development and achievement.

It is given to few men to make their influence such a power for progress and for good in the world as it has been given to Liberty Hyde Bailey. For a quarter of a century he has been a vital force in American agriculture, and especially in horticulture. He has been associated with the New York State College of Agriculture for nearly twenty-five years, and for ten years has been the leader, not only in this great Institution, but in the agricultural development of the whole Empire State. His counsel and opinions have been sought throughout the United States. The name of Bailey must

always loom large in the agricultural history of this period. Only future generations will be able fully to measure his influence.

But it is in his personal relationship with the students, and, indeed, with all with whom he came in contact, that he will be longest remembered. In spite of the pressure of work—and it has always been very great of late—he always found time to keep in personal touch with students, faculty and his friends, of which he has many. His wise counsel was as gladly given as it was constantly sought. Never to our knowledge has any person who had business with him or greetings for him failed to receive courteous welcome and attention.

In a position of great power and with heavy responsibilities, Dean Bailey has never been an autocratic master. Rather he has been the leader. His power to win the confidence of men and to lead them to do the wisest thing is perhaps his strongest characteristic. His leadership has first of all been wise, then forceful, and it has brought results. The laying down of this active leadership will be keenly felt.

It has been said that one measure of a great man is his ability so to organize his work that when he lays it down another can take it up and carry it on without difficulty. We doubt not that the Dean measures up to this standard. His work is by no means finished. He may be called upon to perform even more arduous and responsible tasks than he has already done. We doubt not that he is ready and that he will do them well. He is now free to do them in his own way.

Dean Bailey, without doubt, is the most useful man that American agriculture has ever produced. We desire to express our appreciation of him while he is yet among us. By his resignation the State loses a great director of one of its most useful institutions and a man of rare foresight; the College loses a great executive and organizer; the Faculty of the College and the students lose a wise counsellor;

but we still retain our friend and leader.

We desire him long life and that he may long enjoy the fruits of his great work and see agriculture established upon the plane for which he so long and nobly fought.

The words of Professor Bailey in his memorable speech at the dedication of the buildings of the New York State College of Agriculture we accept as our watchword and guide. And we now pledge him our support in carrying out his dream and life work for the development of the College and the agricultural interests of the State. "This College of Agriculture is not established

to serve or to magnify Cornell University. It belongs to the people of the State. The farmers of the State have secured it; no amount of academic sentiment would have secured it. Their influence has placed it here. They will keep it close to the ground."

Be it then resolved, That a copy of this expression of our appreciation be sent to Ex-Director Liberty H. Bailey and others elsewhere at the discretion of the Executive Committee and that it be placed upon the permanent record of this Association and be transmitted to the CORNELL COUNTRYMAN and the press in general.

INVESTIGATION IN PLANT PHYSIOLOGY

By L. Knudson

Assistant Professor in Plant Physiology, Cornell University

PLANT Physiology does not seek primarily to establish practical rules for guidance of the farmer but to seek and establish the fundamental principles upon which practical knowledge should be based. Plant Physiology, is, of course, not alone in this field but more than any other phase of botany and perhaps more than the other sciences it is fundamental to all the applied plant industry sciences. So, it is, that investigations in plant physiology are very diverse in character and have a bearing upon problems in farm crops, floriculture, forestry, plant breeding, plant pathology, pomology, soil technology and vegetable gardening.

It is six years since the work in Plant Physiology was definitely organized in the College of Agriculture. During that period considerable research work has been done by members of the staff and graduate students, and much work is in progress, but because of its nature it is not readily accessible to the general reader of the COUNTRYMAN. In this brief sketch it is manifestly impossible and even perhaps not desirable, to enter in any details concerning the work. Not all of the

research work will be mentioned but only that which appears to be of a general interest.

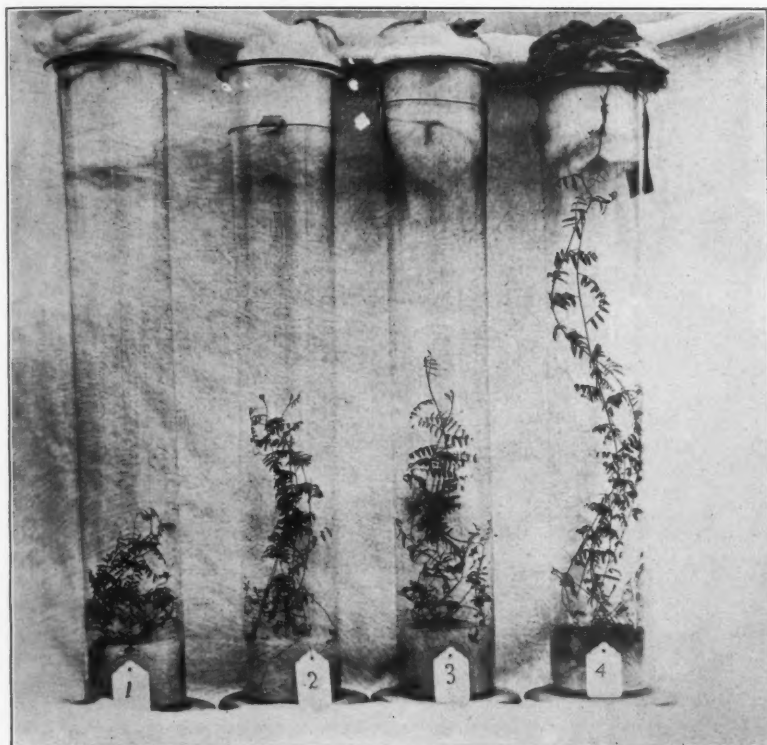
GUMMOSIS OF PRUNUS

The exudation and accumulation of masses of gum on the bark of trees of cherry, plum and peach is frequently observed and is characteristic of a physiological disease known as Gummosis. Results of investigations on the disease were published in 1911. The gum exudation is a resultant of the dissolution of embryonic wood cells forming a pocket just below the bark and cambium. The gum consists of the dissolved cells and their contents. Sometimes the cambium may be destroyed. Gummosis is a traumatic response, that is, it is due to wounding caused by physiological, chemical or biological agents. In the case of cherry, gummosis may start autogenously. In all cases the disease occurs only when the tree is actively growing and when there is an abundance of moisture. The remedial treatment is, as previously stated by other investigators, related to a diminishing of the water supply by drainage or other means.

DIAMETER INCREASE IN TREES

Relatively little is known concerning the season of cambial activity, that is, the season of diameter increase in trees. Does wood formation begin concurrently with bud development? Microscopic studies made with American

lateral increase ceased before August 10. Under certain conditions a second growth may occur in the same season. Such studies with fruits are especially important to the pomologist in deducting conclusions from fertilizer, irrigation, pruning and other experiments.



INFLUENCE OF SUGAR ON GROWTH OF VETCH GROWN UNDER STERILE CONDITIONS, (1) CONTROL CULTURE, NO SUGAR; (2) LACTOSE, (3) MALTOSE, (4) CANE SUGAR

larch, apple, and grape indicate that the formation of new wood and phloem does not begin until the leaves have almost fully developed, and this lateral increase is of relatively short duration, being most rapid shortly after the beginning of cambial activity. In the peach beginning of diameter increase is coincident with blooming. In all

ENZYME STUDIES IN MOULDS

Interesting fundamentally, and also economically, are certain investigations which have been made with certain of the mould fungi. These fungi like others produce ferments or enzymes, each of which is capable of effecting the digestion of a particular organic substance. These enzymes

are secreted by the fungus and effect digestion extracellularly. Investigations show that certain of these enzymes can be regulated in production and secretion by varying the nutrition. Such studies may be important in the interpretation of investigation in plant pathology.

Economically interesting results have been secured as follows: Pyrogallol, which is largely used in photography, and otherwise technically, is derived from gallic acid which in turn is derived from tannic acid by fermentation. If tannic acid along with certain nutritive salts is given to the mould it is fermented and some of the gallic may be utilized by the mould. If, however, sugar is supplied with the tannic acid, the organism utilizes the sugar, ferments the tannic acid to gallic acid, which latter remains in the culture solution. Without the presence of sugar the gallic acid is used as food; in the presence of sugar the mould shows a preferential selection of the sugar, though of course not anticipatory of its better food value and flavor. Sugar can be purchased for five cents per pound, whereas gallic acid is expensive. It is readily evident, therefore, that the addition of sugar is an economical procedure.

BALANCED SOLUTIONS AND ANTAGONISTIC ACTION

In Memoir Number 2 of this station is embodied the results of comprehensive investigation of the influence of various salts on plant growth. This work has extended the investigations on this subject. The nutritive salts when singly in solution or in mixtures not properly balanced with each other show a toxic influence or do not permit of optimum growth. Two nutrient or non-nutrient salts, each of which may be toxic when singly in solution, may mutually counteract the toxicity when combined at the same concentration. Calcium salts especially strongly antidote the toxicity of other salts and particularly of magnesium salts which are extremely toxic. These studies indicate practically that beneficial

effect of liming is due in part at least to the antidoting effect of calcium, and, furthermore, they suggest the danger of application of high magnesia limestone.

SENILITY IN PLANTS

One of the very interesting problems now in preparation for publication is that concerned with senility in plants. Botanists and horticulturists in general have assumed that the plants show no true evidences of senility; for instance, it is stated that the death of an old tree is not due to senile degeneration, but due to disease or to various mechanical difficulties involved. According to them there is no senile deterioration in the meristematic cells (those cells which give rise to new growth) of plants. To determine this point in the meristematic cells is extremely difficult but any difference in the cells should be made manifest in the tissue produced. Such differences are shown in the leaves of woody plants. Mature leaves borne on old vines or trees will have per unit area a greater system of veinage than mature leaves borne on young vines or trees. If the area enclosed by the smallest veins, which areas we may term vein-islets, are measured, it will be noted that the areas vary inversely as the age of the plant from which the leaf was taken. For the grape vine data has been secured which make it feasible to determine the approximate age of the vine by an examination of the leaf. This will be possible also for other perennial plants. Even in the case of water sprouts it will be possible to approximate the age from the parent plant. From the standpoint of the pomologist a method is here available for detecting seedling stock.

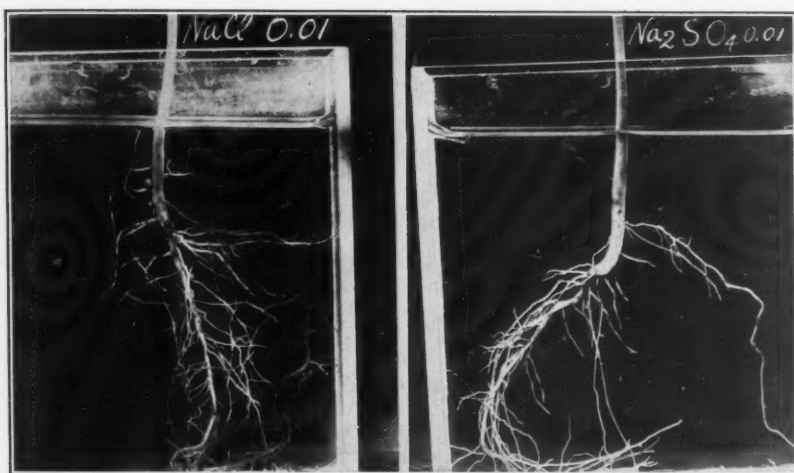
Evidence indicates also that the leaves of old plants are less efficient in manufacturing carbohydrates. If the leaves of old plants are less efficient manufacturing organs than leaves from young plants it would seem advantageous to develop varieties of fruit propagated from seeds and not by vegetative reproduction.

As a result of these studies furthermore, a new theory of senility is proposed in which senile deterioration is considered as due to change in permeability of the cells for which evidence is given.

LEGUME INOCULATION

During the past four years considerable attention has been devoted to investigations on the subject of legume inoculation. Practically these studies have led to the development of the

cial houses that bacteria cannot be bred or increased to any extent in virulence that is, infecting capacity. The studies show, furthermore, that there is a distinct relation between the chemical nature of the soil solution and nodule production. In the volusia silt loam the addition of sulfates and nitrates are detrimental to inoculation while chlorides are stimulative as are the carbohydrates. There is also a relation of nodule formation to moisture content of the soil. Furthermore, it



INFLUENCE OF SODIUM SULFATE AND SODIUM CHLORIDE ON NODULE FORMATION IN SOY BEAN. PLANTS GROWN IN SOIL. THE FIGURE INDICATES THE AMOUNT OF SUBSTANCE IN GRAMS ADDED TO 200 GRAMS OF SOIL

sterilized sand method for the distribution of the legume bacteria. The advantages of this method are ease of handling by the farmer, little danger of contamination and consequent destruction of the legume bacteria, rapid multiplication of the organisms, but more important than all is the retention of viability and certainty of results. Results show that even after three years there are billions of the bacteria present in the soil culture. All gelatine and liquid cultures have a time limit and, furthermore, are subject to injury by exposure.

The studies, furthermore, indicate that contrary to the claims of commer-

has been found in the experiments that the organism may live in the soil yet be unable *per se*, or because of the resistance of the plant, to affect inoculation. It has been found in field studies that the soy bean organism will live in the soil at least three years without the host plant. The experiment is being continued.

ORGANIC NUTRITION OF PLANTS

One of the more recent problems under investigation is concerned with the organic nutrition of plants. The earlier views of plant nutrition were to the effect that all the organic matter of

(Concluded on Adv. page 18)

SIXTH NATIONAL CORN EXPOSITION

By H. H. Love

Professor of Plant Breeding, Cornell University

THE Sixth National Corn Exposition was held in Dallas, Texas, February 10-24, 1914. This exposition is held in connection with the National Corn Association, which was organized seven years ago to further the interests of agriculture. The management decided the interests of agriculture could best be served by holding an annual National Corn Exposition at which the best products of the farm would be shown, with the most scientific methods of their production.

The first exposition was held in Chicago and the second and third were held in Omaha, Nebraska. The fourth was held in Columbus, Ohio, and the fifth was held in Columbia, South Carolina.

The sixth exposition was held under the direction of the National Corn Association, State Fair of Texas, Texas Industrial Congress and Dallas Chamber of Commerce.

There are three general lines emphasized at these expositions, the assembling of farm products to compete for prizes, the staging of educational exhibits from the United States Department of Agriculture and the various states, and programs dealing with the various phases of the farm, farm home and conservation.

The competitive exhibits are brought from all over the United States, each state being urged to bring samples for competition. Most of the states have their state shows and the prize winners from these state shows are brought to the National Exposition to compete for prizes. Such a procedure brings only the finest specimens of farm products to the national show.

The premium list is large and the prizes well worth the competition. Prizes are offered for such products as corn; rye, seed and sheaf; flax, seed and sheaf; buckwheat; alfalfa, seed, sheaf, and bale; timothy, seed and

sheaf; red clover, seed and sheaf; alsike, seed and sheaf; white clover seed; millet; peanuts; blue grass; popcorn; sweet corn; soy beans; cowpeas; wheat; oats; barley; and potatoes.

The value of the premiums offered this year was \$50,000. For the best bushel of corn on the ear the first prize was an automobile. New York State had exhibits of corn, oats, and potatoes. The sample of potatoes competed against all other samples and won the world's championship.

Such an array of farm products is of value to agriculture since it increases competition between the different states and between the different sections of the country. The greatest value, however, is that it establishes an ideal for the producer to keep in mind toward which to work. The farmer, as he looks over the splendid specimens resolves to better his system of farming so that he may produce such samples. If he is progressive, he begins to look about to see where the information may be had.

From these competitive exhibits his attention is directed to the educational exhibits which are brought to the National Corn Exposition by the United States Department and the various states.

In looking over the various exhibits the farmer finds the answer to questions that have been bothering him for some time. As he passes from exhibit to exhibit he is impressed by the fact that agriculture is one of the broadest of subjects and that a large army of workers are busy attempting to solve some of the very perplexing problems. The entire exhibit has the effect of renewing the enthusiasm of the farmer and he feels more than ever that agriculture is a dignified field and that much work is being done to aid the practical man.

The exhibit that was taken to Dallas by the United States Depart-

ment of Agriculture was one of the largest that the Department had ever sent out. It covered an area of ten thousand square feet. The work of the Division of Forestry was emphasized and well illustrated by pictures, charts, and exhibits of various sorts. The effect of deforesting was illustrated by an exhibit showing the eroding on the deforested soil while no erosion was noted on the soil which was covered with trees. The work of the Divisions of Soils and Plant Industry was well illustrated by the results of soil studies and many specimens of cereals. The Office of Public Roads exhibited many types of roads illustrating the materials used in construction and methods of building.

Other divisions from the Federal Department having exhibits were Chemistry, Animal Industry, Entomology, and the Weather Bureau. All of these exhibits were excellent and gave some very instructive lessons along the various lines.

About twenty-seven states were represented by exhibits. Each exhibit was attended by two or more members of the college staff. All of these exhibits showed the results of the latest experimental work along the lines of soil or seed improvement, rotations, systems of cropping, results of various sorts of feeding and the like. For example, Nebraska showed the amount of water required by a corn plant at different hours during the day and under different soil treatments. Results given in the Nebraska exhibit showed that a one crop system was not a profitable one to follow. The two leading crops of Nebraska are corn and wheat, but it is not profitable to depend upon all wheat or all corn. The fact that it did not pay to fan or reclean seed wheat was also illustrated in this exhibit.

The Iowa exhibit showed a map of the state made up of the principal soil types. The relation between the rate and rapidity of the germination of corn and yield was also well illustrated.

The California exhibit showed the method used in fumigating a tree in

the orchard. The tree was covered with a large tent and fumigated. The results showed that this method is very successful.

The Illinois Station showed the composition of a bushel of corn and the results which have been accomplished in increasing and decreasing the oil and protein content of the corn. The important results of their soil investigations were also shown.

The Missouri Station showed, among other things, the importance of seed selection. A selection from Poole wheat had given an increase of 6.3 bushels an acre over the parent variety. A selection from Fulcaster had given an increase of 8.4 bushels an acre over the parent variety.

The Colorado exhibit contained samples showing the results obtained by crossing different varieties of cereals in an attempt to produce new profitable sorts.

Wyoming showed a large display of different types of wool, while South Carolina showed the results obtained from different types of cotton.

Space does not permit giving all the interesting features displayed by the different states. All the state exhibits showed that much thought and money had been used in assembling them.

Daily programs were arranged during which talks along the various lines of agriculture, country life, and farm home were given. Many leading men were brought from all over the country to talk on the various subjects.

Together with the exhibits, demonstrations, and lectures the Sixth National Corn Exposition represented the greatest agricultural affair that has ever been brought together.

There were some entertainment features which served to rest one from the study of exhibits. This seems necessary, since one cannot spend all the time in study and taking notes without some recreation.

The exhibit from Cornell was in charge of Professor A. R. Mann, E. G. Montgomery, J. R. Livermore, W. C. Etheridge, Royal Gilkey, and the

writer. The experimental results from the Department of Farm Crops, and the Department of Plant-Breeding were shown together with the rural community center.

The exhibits from the Departments of Farm Crops and Plant-Breeding were practically the same as were used at the New York State Fair, and space does not permit describing them in detail.

The rural community center also was exhibited in the same manner as at the New York State Fair. The Cornell exhibit received much favorable comment.

The National Corn Exposition, representing as it does the greatest agricultural exhibit ever assembled, is such a valuable institution that it certainly should live and continue its service to the people.

THE HONOR SYSTEM

By E. S. Bird

Chairman of the Honor System Committee

SINCE the organization of the new Honor System a number of questions have arisen and it is the purpose of this statement to make clear the attitude of the committee regarding several of these.

This committee has jurisdiction over cases of fraud in class rooms and in all examinations. The system is on trial. In order to give it a fair trial instructors are going to find it convenient to be out of examination rooms except while giving out papers and answering necessary questions.

Two suggestions have been made regarding the reporting of cases of cribbing. One, that we have a secret service squad to police examinations. This, of course, is entirely opposed to the spirit of the Honor System and the committee feels that it would not be practicable. This method would force the System upon the students and this is exactly what we do not want to do. If the student body does not want the System, the sooner we have faculty control of examinations the better.

The other suggestion is that when a man sees another cribbing, he go to him and say, "I have seen you cribbing and will give you three days to report to the Committee, if you do not report in that time I will report you myself." This is a new idea and one, we think worthy of trial. As it is now, cases of

cribbing are reported directly to members of the Committee.

The man who cribbs lowers the standard of the B.S. degree, the man who lets another cheat admits that he is willing to have the dishonest person get a certificate, having the same value as his own, on another student's work.

The Committee recommends that whenever possible students in examinations sit in alternate seats and directly behind the persons in front of them.

The System is working. *The Cornell Sun* for February fourth contained the following:

"The Committee on Student Affairs approved the recommendation of the Committee on Student Honor of the College of Agriculture that a winter-course student in Poultry Husbandry be dismissed from the University because of fraud in examination." Subsequent recommendations are:

To place a senior on probation till June.

To deny a sophomore credit for a course and place him on probation until June. One case concerning freshmen from another College was turned over to the Faculty Committee.

The success or failure of the present System depends entirely on the spirit of cooperation of the student body with the Committee, for we already have the cooperation of the Faculty. The Committee invites criticism and suggestions.

FRUIT GROWING IN THE NORTHWEST

E. L. Markell

THE question comes to many of us who are contemplating fruit growing, where can I plant an orchard to the best advantage,—which is better, the East or the West? We hear a great deal about the northwestern part of this country, and we wonder

writers for this purpose. The writer may have paid a short visit to the region which he attempts to describe, or he may have composed it from information furnished him by someone else. Many of the pamphlets are truly works of art. They contain



ONE OF THE LARGEST AND MOST SUCCESSFUL PEAR ORCHARDS IN THE
ROGUE RIVER VALLEY, OREGON

if this section is endowed with all of the natural advantages which are claimed for it, whether it is, in fact, the El Dorado of America. For most of us, the only sources of information on this subject are magazine articles, or the elaborate pamphlets that are published by the commercial clubs in all of the large fruit growing sections of the West. The magazine articles are frequently the work of land promoters, who have even been known to secure the services of skilled

photo-engravings of beautiful orchards heavily laden with fruit, and of unsurpassed bits of local scenery. The impressions which one gets from these is often misleading. They convey the idea that a western fruit orchard is a never failing source of comfort and profit. Some of them may be, many are not.

The history of all of these sections is very similar. A quarter of a century ago, a plow had never touched most of the land that is now occupied by

orchards. A few of the settlers grew fruit, but mainly for their own consumption. Very little of it was sold. The land and the climate proved ideal for fruit growing, and the trees produced the most beautiful fruit that the owners had ever seen. Some of this gradually made its appearance on the markets of the East. It was much more attractive than most of the fruit that was produced in the

restricted areas, but these areas gradually widened until whole sections were planted with nothing but fruit trees. The tremendous demand for land in these sections very rapidly increased its value. This invited real estate speculation, and three or four years ago, many of the prominent fruit growing sections had forty or fifty real estate dealers, who were eager to sell ignorant settlers anything from an



THE DALLES OF OREGON. A REGION OF DIVERSIFIED FRUIT GROWING

East, and people were willing to pay a good price for it. This stimulated a trade that increased slowly but surely. The distance to market was very great, and the transportation facilities poor, so that it only paid to ship the very best fruit, and it had to be packed with great care. The profits resulting from this business naturally resulted in an increase of the industry. More people wanted to grow fruit, and the demand for orchards and fruit land increased rapidly. At first it was thought that orchards would thrive only in certain

acre of sage brush to a well developed orchard, at a fabulous price. They are largely responsible for the descriptive pamphlets which have deluged the country. Some of the information contained in them is fact, and some is fiction. In most of these sections, certain individuals, through a happy combination of favorable conditions, and the exercise of good common sense, have made large profits. Records of these successes are always given a prominent place in the literature relating to a locality, and to the man

whose ideas have already been distorted by extravagant tales of western possibilities, they are but representative. The city man who longs to be a farmer, readily believes them. They are in strict accord with his preconceived notions. As a result, thousands of people have moved from the city, and have settled in these communities with no more knowledge of the section in which they are to live

sized tract of land, plant his orchard, and still have enough money to live on until his orchard comes into bearing. Better still, he can buy a bearing orchard, which will give him immediate returns, or at least give him something to experiment with. He has a great deal to learn, because orchard conditions in the Northwest are different from those in other sections of the country, but the man of means is



A VERY PROFITABLE PEAR ORCHARD

than is given in these booklets, which they carry with them. Most of the disappointment which has followed the settlement of western fruit growing sections is due to the fact that the settlers have not investigated the conditions themselves, before buying the land. Some of the settlers have wealth; others have barely enough to purchase a small piece of ground and build a shanty. The man of wealth has a fair chance for success, if he cares for the new conditions under which he has to live. He can purchase a good

better able to withstand the adversities that must almost surely be encountered, than his poorer neighbor. Examples of success and failure may be found side by side in the fruit business as well as in other lines of industry, and, in most cases, the difference is not due to a difference of thrift, or of natural ability, but simply to the lack of sufficient capital on the one hand, and the possession of it on the other.

The Northwest is a great fruit producing country. One would hardly

hesitate to state that orchards of a given age are, on the average, more productive in the West than in the East. This is doubtless in part due to better care. We hear considerable discussion as to the relative qualities of the fruit from the two sections, and while most people agree that the western fruit is more attractive in appearance, many feel that the eastern fruit is higher in quality, or flavor. There is some ground for this belief, but it is the writer's opinion that the leading varieties of apples of the West are as high in quality as the leading varieties of the East. These, in brief, are the main advantages of the West as a fruit producing country. The disadvantages should also be carefully considered. Most prominent among these is the distance from market. Freight rates are so high, that unless the market prices are good, it does not pay to ship east, and that is where the bulk of the crop must be sold, under the present conditions. The season of 1912 may be taken as an example. The tremendous shipments of western box fruit during that season, together with the large crop of apples all over the country, reduced prices to such an extent that very few western growers made any money at all, and many lost money on their crop. Several factors combine at the present time to make it practically impossible for the average grower to make money during a season of widespread large production. One is the rather poor system of marketing which is in vogue, but which the shippers are trying to improve. Another is the waste of second grade fruit. As has been previously stated, it only pays to ship high grade fruit to the East. The fruit which falls below this grade is frequently of considerable quantity. Some of this is consumed in the local markets, and some of it goes to the cider mills, but a great deal of it is wasted every year. Comparatively little fruit is dried in the Northwest. This could be made a very large source of income, especially when prices are low. Over-specialization is

probably the greatest handicap to prosperity in most of the western fruit growing sections. Hood River Valley in Oregon, is one of the most prominent examples of extreme specialization. Practically all of the cleared land in this section is planted with orchards. The valley has been well called a mammoth apple orchard. A few years ago, these orchards were all cultivated intensively, and apples and a few pears and strawberries were the only products of the soil. Practically all of the food consumed by the inhabitants was brought in from other parts of the country at expensive freight rates. It was estimated last year that \$50,000 worth of dairy products are imported annually by the inhabitants of this valley, and other food products in proportion. Conditions have changed somewhat during the past three years and they are changing all of the time. The orchards are not now cultivated during all the growing season, and most of the growers are planting cover crops of clover, which are left on for a year or more. These are often cut and harvested. This is not in strict accordance with good orcharding principles, but conditions seem to permit it in the West, and economy demands it. The soil is naturally rich, and all of the orchards in sod are regularly irrigated. Water is abundant, and there is little danger of the cover crop robbing the trees of moisture. Many of the growers are now keeping a cow or two, and some are establishing milk routes. Small stock raising is attracting the attention of many of the growers, and it is evident that most of them are beginning to realize the necessity of establishing some kind of a side line, that will provide them with sufficient income to help tide over unfavorable conditions. It is also to be noted that comparatively few new orchards are now being planted in Hood River Valley. In fact, it is said, that one grower pulled up the trees on twenty acres of his young apple orchard, and replanted this entire area to clover. Very little land is being sold at the

present time, and it is reasonable to expect that land values will become readjusted within a few years, and based more upon their actual earning capacity.

Not all of the fruit growing sections have made the mistake of basing all of their hopes on one crop. Some of them which may be classed as diversified fruit sections are producing a great many different kinds of fruit in considerable quantities. The Dalles, a section about twenty miles from Hood River is an example of this type of fruit region. It is noted locally for its peaches, but other fruits are grown there in abundance. Some of the farms are producing apples, peaches, pears, cherries, prunes, and grapes, and appear to be quite successful. This section makes the same mistake as Hood River in that the bulk of its food supply is produced elsewhere.

When we finally consider the Northwest as a place to live in, we are bound to make a favorable report. It is said that anyone who has lived in

this section of the country for a year or more, never cares to live elsewhere. This appears to be almost literally true. The scenery, especially in the mountain valleys, is almost unsurpassed. Hood River Valley, with its snow-capped mountains, looming up eternally white at either end is an ever-changing scene of magnificent splendor. The climate, too, is very pleasant. One never feels the extremes of temperature that are so often encountered in the East. The days are mild practically all of the year, and the nights are cool. The rainy season, which occurs on the Pacific Coast during the winter, is somewhat unpleasant, but most of us feel that there is considerable truth in the western "booster's" remark that there are some unpleasant features to every section of the world, and that the Pacific Northwest is generously supplied with the pleasant ones.

The pictures shown are by courtesy of the U. S. Department of Agriculture, B. P. I. Division of Pomology and Horticulture.

VEGETABLES FOR EVERY MONTH

By Paul Work

MOST people insist on eating every day of the year. This means that our markets must supply the products of the farm to the consumer constantly and without any interruption. Fortunately, most of the animal products are yielded more or less uniformly throughout the twelve months, and storage comes into play merely as a balance wheel for the evening up of the supply. Plants, however, yield their crops only during their regular seasons and are fruitless through many months. In the case of the staple products, as the cereals, the problem of distribution is comparatively simple, for they are non-perishable.

Modern folk are not satisfied with a diet of cereals and meat and dairy products. The vegetables, together

with the fruits, constitute twenty-five per cent of the food consumed. These are perishable things, things that may be easily offered only during the summer and early autumn. The insistent demand continues throughout the four seasons, and it can be met only by special foresight, special care, and special equipment. Few realize as the toothsome delicacies of the garden are set before them the complexity of the devices for hastening maturity and for preventing spoilage and for speeding transportation that are involved.

The first factor that is brought into play in bringing the curve of supply to conform with the curve of demand is the ingenuity of the grower in the management of his operations. He strives to coax his fields into early pro

duction and he strives to continue his harvest well into autumn months. He selects the warmest slopes and lays drains and plows in the fall, that he may plant as soon as possible. He applies quickly available fertilizer, cultivates ceaselessly, and irrigates copiously in order that maturity may be hastened. Knowing when a given block of a crop is likely to cease production, he makes later plantings, and thus is able to sell regularly through several months.

the seeds were sown in place. During their early growth the plants only partly utilize the soil. The gardener rises up a great while before spring and makes his sowings under glass. By the exercise of a skill which is born of years of experience, he is able, as soon as outdoor conditions are favorable, to set out well grown and well hardened plants which are ready to make uninterrupted progress toward full bearing. Plant growing and transplanting, even without glass, often permit the pro-



5000 SASH FOR CELERY AND LETTUCE. ABOUT ONE MONTH IS GAINED

This, however, is not enough. Parts of his fields which are occupied during the midst of the growing season by tender crops may be utilized in the spring and fall for hardy crops which make active growth in the intervals between frosts. Thus may radishes or turnips or peas be planted as soon as the ground can be prepared, to be followed by a midsummer crop of tomatoes. These may be removed in time to sow spinach for very late fall and very early spring cutting. Two cool season crops may also be grown on the same ground in a season, as early cabbage to be followed by late celery.

Such intensive plans could not be carried out to the best advantage if all

duction of two crops on a given acre whereas otherwise the time would serve but for one. Late cabbage may thus be set after early peas or beans or even celery.

Even with the result of this far-sighted planning and persistent care, the city dweller is not yet satisfied. He still insists that his winter menu shall not be greatly different from his summer menu. Here must be called into play all the varied devices of preserving and storage. An enormous volume, about eighty million dollars worth of the summer crops, are marketed not in open packages, but in sealed cans. The variety of food which is in this way available is

increasing every year, and the processes have been so highly perfected that the quality in many cases rivals that of the freshly cooked product.

To distribute his crops and, incidentally, his income through the winter months, the grower must rely upon the storehouse and cellar and pit and trench. He doles out from these hiding places his market's daily needs of celery, cabbage, onions, and all the many root crops. Of recent years mechanical cold storage has come into use for celery and even to lengthen the season of muck land lettuce.

Nearly seventy-five years ago the trucking industry had its birth in the Norfolk section and since that time the development of transportation facilities and the improvement of the refrigerator car have made it profitable for many sections, where climatic and soil conditions favor, to contribute to the feeding of distant cities. To borrow the language of the produce trade, long before "up-state storage stocks of cabbage are cleaned out, 'carlots are rolling from Gulf Coast points." Solid express train loads of asparagus, celery, and melons make their way across the whole breadth of the continent from southern California. Texas begins to ship its onions in March, and early Spring sees tomatoes from Mississippi and Tennessee on their way northward. Such crops as spinach, kale, and the salads know no winter in Louisiana and Florida. Nor is the shipping business entirely engaged in bringing southern produce North. The cities of the South are enjoying marvelous development and their people are as insistent upon enjoying the delicate products of a milder climate during the summer months as are our northern people on being supplied throughout the winter. August and September find several rapidly growing New York trucking districts forward-

ing cars of peas, lettuce, celery, tomatoes, and cucumbers to the central and southern cities. October and the winter months find enormous quantities of northern grown cabbage and potatoes on their way to the great consuming centers.

With all these skilfully devised schemes of garden management, of preserving, of storage, and of transportation, becoming each year more perfect in their operation, it is hard to believe that every demand is not fully met; but the most highly specialized and most exacting and withal the most highly intensified of methods for insuring continuity of supply is yet unmentioned. Though threatened by competition from all the others and especially from the southern truck gardens, the vegetable forcing industry increases without a pause. Though fifteen months ago a mighty cry of over-production went up from the vegetable greenhouses, losses were more than recouped during the later months of the winter, and new ranges of glass are being built each summer. The economy of large scale production and the improvement of methods with advancing years of experience point to the continued success of the gardens under glass.

And yet with all the marvelous progress of the past twenty-five years, a visit to our markets and green grocers reveals not only vegetables and fruits that are fresh and tempting, but also products that are blemished with insects and diseases, that are wilted and stale, that, even though attractive in appearance, lack in quality when prepared for the table. In many places and much of the time there is an absolute dearth of some of the crops that should be available at every season. Even yet is there room for progress.

The Cornell Countryman

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APRIL, 1914

Elections

Howard E. Stern '17, of Philadelphia, Pa., has been elected to the Editorial Staff.

The Students' Association

A large eastern university has started the custom of setting aside a day each year which is called Alumni Day. The graduates of the college attend recitations, listen to talks by prominent undergraduates and go over the everyday problems with the officers. The alumni are thus encouraged to take an active interest. Needless to say such a university will continue to grow and develop.

In the College of Agriculture where the problems of most of the graduates remain identical with at least some of the problems of the College, is there not all the more reason for a greater active interest in its affairs on the part of the graduate? The first step toward an active interest in the college should

be to join the Students' Association. Any person who has ever attended the College of Agriculture is eligible to membership. It costs \$2.00 to join the Association and the annual dues are \$1.00. The membership is very small as Mr. Seymour points out elsewhere in this issue. In order to carry on its activities it needs your money but your active interest is more important. The association will keep you in touch with the affairs of the college. The question now arises as to whether your college course has been worth one dollar a year or not.

Athletic Activities

The Ag. Basketball Team closed its season by winning over M. E. 20 to 16. Although this season's games have not been as successful as desirable, the team deserves credit for its hard work.

At present twenty-five Ag. men are registered for intercollege crew. It will soon be time for out-of-door practice and those in charge would like to see an increased number of candidates. To make the Ag. crew means a big step toward the Varsity because the training the men get gives them a decided advantage over the untrained.

F. W. DeGolyer, '15, has been chosen captain of the Ag. Track Team and R. C. Shoemaker, '14, manager. Last year we won the Inter-college Track Championship for the first time. A large number of candidates is required this year in order to repeat the trick.

The Ag. Baseball Team has begun regular daily practice under the direction of Captain F. E. Rogers who emphasizes the fact that all the positions on the team are open to competition. It is quite important that every

man who can play baseball and is unable to try out for the Varsity do his utmost toward making ours a winning team in the Inter-college League.

Incorporation During the past month the COUNTRYMAN has been incorporated under the laws of New York State. The work of incorporation has been done in a very efficient manner by Mr. F. Dobmeier, a graduate student in the Law College. The following directors have been named: L. H. Bailey, J. B. Taylor of the Taylor-Carpenter Company, J. J. Swift '14, F. W. Lathrop, graduate student, and H. M. Stanley, '15. It is expected that the incorporation will be of much benefit to the COUNTRYMAN in a business way.

University Hour It may interest our former students to know that a movement is on foot to establish a University Hour. On March 13 a dinner was given to representatives from the student organizations in the university by the senior societies in the College of Agriculture. The following is the resolution which was adopted:

"Whereas, It is desired to have a general assembly of the undergraduates and Faculty from time to time in order to bring together the students of the various colleges with a view to promoting acquaintanceship and a more unified spirit throughout the University;

Also, To provide for a time when all students may assemble to hear prominent speakers, musicians, etc.;

And further, To furnish an opportunity for undergraduates to discuss their student problems and affairs—

We, the undersigned, speaking in behalf of our respective colleges and organizations, respectfully petition the President and Faculty of the University to set aside the hour from 12 to 1 every other Friday to be at the disposal of the students; that the use of this hour be in the hands of a committee of students acting with the President of the University; such committee to consist of three seniors, two juniors and one sophomore, appointed by the presidents of their respective classes, the presidents of these classes to be members ex-officio."

It is planned to have these gatherings in the New Auditorium. The idea is meeting with approval throughout the University.





CAMPUS NOTES

A DIRECTORY OF STUDENT ACTIVITIES

Crew—Captain, M. F. Abell, '14.
 Baseball—Captain, F. E. Rogers, '14;
 Manager, R. C. Shoemaker, '14.
 Track—Captain, F. W. DeGolyer, '15;
 Manager, R. C. Shoemaker, '14.
 Cross Country—Captain, F. F. Sullivan, '15.
 Soccer football—Captain, R. H. Cross, '14; Manager, A. G. Landres, '16.
 Basketball—Captain, R. F. Steve, '14;
 Manager, T. M. Gray, '14.
 Agricultural Association—President, F. E. Rogers, '14; Secretary, Miss Mary Doty, '14.
 Senior Class—President, L. E. Card, '14; Secretary, J. G. Wilkin, '14.
 Junior Class—President E. C. Heinsohn, '15; Secretary, A. W. Wilson, '15.
 Sophomore Class—President, Stuart Wilson, '16; Secretary, Miss Ruth Smith, '16.
 Freshman Class—President, A. W. Richards, Special; Secretary, C. A. Thompson, '17.
 Student Loan Fund—Chairman, R. C. Shoemaker, '14.
 Student Honor Committee—Chairman, E. S. Bird, '14.

* * *

The program of the March Assembly was a treat to all who were present. Several very pleasing musical numbers were given by the Agricultural Glee Club and a string quartet. F. E. Rogers, '14 the president of the Agricultural Association read a letter from the Winter Course students in which they expressed their thanks and appreciation for all the kindness and interest

shown them by the regular students. Director Stocking made an announcement of the trophy won by the Pomology Judging Team and he expressed the desire that this might be continued as one of the activities of the college.

Dr. J. G. Needham, the speaker of the evening, gave a very interesting talk on "The Common Ground of Poet and Naturalist." Professor Needham's remarks were composed largely of readings from several of the world's most famous poets, as illustrations of the fact that the poets base much of their work on the common things in nature. He stated that the Poet and Naturalist both use the same raw materials which are the common, homely things, generally near at hand and intrinsically valueless, an ore bed to them and but a gravel heap to the ordinary person.

The literal adherence to fact is less expected of the Poet than of the Naturalist and their observations of details are quite likely to vary. To illustrate this Professor Needham compared the Poets, Lowell and Burns. The former was a plowman nearly all his life, while the latter was trained in the laboratories at Harvard. Their training accounts for the difference in the treatment of details, to some extent. Poets, like Naturalists, usually receive their inspirations in their childhood, to which they all testify in their poems." The Naturalist should only expect the Poet to learn to see things as they are and then to tell the truth about them."

In closing his talk Professor Needham read, Wordsworth's "Ode to Nature."

Mr. M. Spiegel has been placed in charge of the gardens and experimental work of the Vegetable Gardening Department. He attended the Baron de Hirsh School at Woodbine, N. J., and was a student here for three years. He was later employed at the Empire City Farms near Cuba, N. Y., and still more recently at the Mohegan Lake Farms near Peekskill.

* * *

Arrangements have been made between Alfred University and also with the University of Rochester for coöperative work with the State College of Agriculture. These arrangements have been made on the initiative of the two universities mentioned. At Alfred University coöperative extension work of a somewhat general nature is to be done by Professor C. O. DuBois of the State School of Agriculture at Alfred under the supervision and maintenance of our Extension Department.

The coöperative work with the University of Rochester involves investigations of plant diseases among vegetable growers at Irondequoit. The expert, who will do the field work, will be under the immediate direction of the University of Rochester and will have the use of its laboratories. He is also expected to consult freely with the Department of Plant Pathology at Cornell University and the department here will also furnish certain equipment for the field work. The salary of this expert will be paid by the University of Rochester and his field expenses by the College of Agriculture. The plant diseases among the vegetable growers of the state result in large financial losses each year and it is hoped that this work will result in materially decreasing these losses. The results of this coöperative work will be published by the College of Agriculture. It is distinctly understood that this work will be carried on with the very closest cooperation of the University of Rochester and the College of Agriculture.

* * *

Professor J. G. Needham's new book, "The Natural History of the

Farm," is in the hands of the printers, and will be on sale soon. The first 136 pages of this book were issued last fall. The "Farm" course now consists of one lecture and one laboratory period a week. It is arranged that the book be used in place of lectures. It is illustrated by a large number of drawings and pictures. It also includes a map of the University Farm, showing the location of hills, woodlots, pastures and cultivated lands, etc. This is a valuable addition to the agricultural text books of Cornell, and should be of great benefit to the future freshmen.

* * *

"Fruit Insects" by the late Professor M. V. Slingerland and Professor C. R. Crosby has recently been published by the McMillan Publishing Company. The book is beautifully illustrated by photographs taken by Professor Slingerland. Professor Crosby undertook the revision of the documents after Professor Slingerland's death and the publication has consequently been delayed.

* * *

Mr. Etheridge, assistant in Farm Crops has been at Washington, D. C., engaged in collecting leguminous plants which will be used for class demonstration and for study. The plants of economic value were first obtained and then the related types. Mr. Etheridge has more than one thousand different specimens at present. These plants were obtained from the Bureau of Seed and Plant Distribution at Washington as well as other government stations over the country. Some types were from the Hawaiian Islands and from Porto Rico. It is a very exhaustive collection.

* * *

Mr. S. L. Stewart, proprietor of Brookside Farms, Newburg, N. Y., was a visitor at the College during Farmers' Week. Mr. Stewart donated the sum of \$50 to be distributed as prizes in a clean milk contest. This contest was conducted by the Dairy Department. This is the third time Mr. Stewart has donated money for this purpose.

Professor G. F. Warren, of the Farm Management Department, is spending a part of his sabbatical leave at Athens, Ga. He plans to spend several months in the South, studying social and agricultural conditions.

* * *

Mr. R. H. Patch, instructor in floriculture, has been granted a three months leave of absence, and will spend this time in practical work with the H. A. Dreer Company of Philadelphia.

* * *

The Department of Floriculture at Cornell and the Bureau of Plant Industry at Washington have been designated by the American Rose Society to carry on investigations with hardy roses. It is expected that extensive plantings of many varieties of roses will be made on the experimental plots during the coming season.

* * *

Mr. Warsaw, a graduate of Iowa State College, has been appointed assistant to Professor E. O. Fippin. He is a specialist in soil drainage and will do demonstrative and cooperative work with the farmers of the state.

* * *

The Forestry Department has partially completed plans for a meeting on May 15 to dedicate the Forestry Building. Many prominent men in the profession, including the Chief Forester, H. S. Graves, and Mr. Gifford Pinchot, will address the sessions.

The Forestry Club is planning a boat ride on May 16, as entertainment to the guests here at the dedication of the Forestry Building.

At the Annual Forestry Banquet at the University of Michigan on March 24, Professor Mulford of the Forestry Department spoke on "Our Profession."

* * *

Three departments had exhibits on the Agricultural Car run over the Lehigh Valley Railroad from March 2-13 inclusive. J. R. Livermore had charge of Plant Breeding, Mr. Reisner of Farm Crops and Professor Cross of Agricultural Chemistry.

The Department of Pomology has leased an orchard of Mr. L. Houghtaling of Port Byron, N. Y. The trees in this eight acre orchard were originally planted too close together and have grown so that the branches interlock. It is the purpose of the department to test for various methods of improving this condition which is common to many orchards of the state. In one part of the orchard every alternate tree will be removed and in others the trees will be severely trimmed. The fruit will be used for testing the worth of different fruit graders that are on the market.

* * *

The installation of the organ for the Auditorium has been commenced and will be completed by April 1. This organ has over seventy stops, thirty more than the number on the organ in Sage Chapel. As a result, a much greater number of effects will be possible. Although such a huge instrument is in the Auditorium, all parts except the swell box on the platform will be invisible to the audience.

* * *

R. J. Gilmore, instructor in the Farm Course, has accepted the position as head of the Biology Department of Huron College, Huron, S. D. He will return here for the summer term to obtain his doctor's degree.

* * *

At a meeting of the Floriculture Department of the Lazy Club on March 2, Professor E. G. Davis of the Landscape Department of the College delivered a lecture on the "Relation of Landscape Art to Floriculture."

* * *

A. T. Fabis, a graduate student, and B. R. Leach, '14, of the Department of Entomology have received appointments in the United States Bureau of Entomology and have left to take up their work.

* * *

Dr. T. L. Lyon, head of the department of Soil Technology, has returned from a trip through France and Germany. He visited Leipzig, Paris and the Rothamsted Experimental Station.

FORMER STUDENTS



PROFESSOR C. A. ROGERS

'04, B.S.A.,—'07, M.S.A.—C. A. Rogers, who was an assistant professor in the Poultry Department of the College, left Cornell last month to go back to his farm at Bergen, N. Y., a town eighteen miles from Rochester.

As a student, Professor Rogers did excellent work, becoming a member of Sigma Xi. Active in student affairs, he played on the first Ag. football and baseball teams and was the first president of the Poultry Association. As such, he was in charge of the first poultry show at Cornell. He is a member of the Alpha Zeta fraternity.

Taking his B.S.A. degree in June, 1904, he returned the following September to work for his Master's degree. But he left the university that winter to take charge of the trial seed grounds of the James Vick's Sons Seed Co., Rochester, N. Y. After spending the spring and summer there, he went back to his home farm. In the fall of 1906 he returned to Cornell as an Assistant in the Poultry Department and took his M.S.A. degree in 1907. For his

thesis, he worked out a "Comparative Anatomy of Domestic Fowls." This will be published very soon in book form.

As an assistant, he was in charge of the experimental pens of the department. He, himself, carried on a very interesting experiment in color feeding of poultry for egg production. The fowls were fed various color dyes to see if they would affect the color of feathers, flesh and yolk of eggs. He discovered that rhodamine, a red analine dye, colored the nitrogenous parts.

In 1907, Mr. Rogers was made instructor and two years later Assistant Professor. His teaching had to do primarily with construction and mechanical work, the history of breeds, and judging. He did considerable extension work and wrote several bulletins.

All the time he was a member of the teaching staff of the College, the desire to go back to his farm steadily increased until last fall he decided that he could stay away no longer. He bought his father's farm at Bergen, N. Y., and in February left to take charge of the place. This is a general crop farm of 70 acres, with 17 acres of orchard and 1300 White Leghorn fowls. By next summer Professor Rogers expects to have increased this number to 3000 layers. Thru the columns of the COUNTRYMAN he issues an invitation to the students to come out and see him. He says that a Cornell face will always be welcome.

'84 B. S.—J. B. Burrows is director of Farmers Institute work in the 19th Congressional district of Illinois with headquarters at Decatur. Besides this work, he is running his own farm in a very successful manner.

'91, B.S.A.—Jared Van Wagenen, Jr., of Lawyerville, N. Y., is actively interested in Farmers Institutes in this state, and has been lecturing at various places. On February 27 at Columbia University, New York City, he spoke on "Farms and Farming in New York

State." This was one of a series of lectures that are being given at Columbia, under the auspices of the Farmers Institute, for the benefit of city-dwelling farmers or those men who wish to become farmers. A vague notion is possessed by most city people that they could become very efficient farmers without any experience or knowledge of farming conditions. These lectures and conferences are doing a great work in discouraging those people wholly unfitted for farm life from going on the farm, and are helping others, who are qualified, to get the requisite viewpoint necessary to become successful farmers.

'95, W. C.—Harmon W. Thornell was one of the many former students here Farmers' Week who was a welcome visitor at the COUNTRYMAN office. He is located on a prosperous 170 acre farm at Pittsford, N. Y., where he is helping his father. This is a general farm with a small herd of Holstein cattle, furnishing marketable cream and skimmed milk for the pigs.

'00, Ph.D.—K. C. Davis writes from Nashville, Tennessee, that the first opening of the School of Country Life will be the summer session on June 25. From then it will continue through each college year and summer session. This School of Country Life will be a part of the George Peabody College for Teachers which is the central teachers' college of the south. This new school will give these teachers a knowledge of the work of farm demonstration agents, boys' and girls' club workers, and others who are carrying the "new agriculture" to the South, by bringing them in contact with those people engaged in these lines of work who it is expected, will take the course. Besides the science of farming, there will be especial attention given to such subjects as: rural credit, economics, coöperation, conservation, making the homes more comfortable and livable by introducing running water, sewage, etc. and other subjects that have to do with rural life. This school is founded for the purpose of developing leaders for rural communities.

'02, B.S.A.—I. F. Worthley is Forester for the Pennsylvania Railroad with his office located at the Broad Street station, Philadelphia. He visited his Alma Mater the last of February to see the new equipment that has been added to the Forestry Department.

'08, B.S.A.—William E. Harris is practicing in Toronto, Ontario, as senior member of the firm of W. E. Harris & A. V. Hall, landscape architects and engineers. Their offices are at 71 Bay Street.

'08, B.S.A.—Frank S. Hayden was married in January to Miss Mable N. Matthews of Buffalo. They are now at home in the Oatka valley near Wyoming, N. Y., where Hayden is managing a 300 acre farm.

'08, B.S.A.—P. O. Wood, who was reported in our February issue as being in Colorado on a soil survey, has recently resigned from the Bureau of Soils, U. S. Department of Agriculture, and is now with his father in the general insurance business in Ithaca. The name of the firm is P. W. Wood & Son.

'10, B.S.A.—I. J. Shepard of Batavia, N. Y., told the Farm Management Seminar on February 25, how the Genesee County Fruit Growers' Association was organized and what it is accomplishing. There was a great need for some kind of an organization in this community that would help the farmers to improve their quality and quantity of apples and pears and would enable the farmers to obtain a more profitable market. Of course the first year proved a tartar and the Association was bitterly opposed by the local produce commission men. The final success was made possible only by the unswerving loyalty and self-sacrifice of the directors and those members who believed in coöperation. Now, this Association is firmly founded and has proved extremely profitable and helpful to its members. How profitable, may be imagined from the fact that this year some of the apples sold for nearly half again what the local commission men were paying.

(Continued on adv. page 12)



B. P. Cogswell's Silo, Auburn, N. Y.

A SILO THAT WILL LAST FOR GENERATIONS

Auburn, N. Y., Nov. 26, 1912
Gentlemen :—The Imperishable Silo I bought of you and erected this fall and filled with ensilage is satisfactory in every respect so far. It has attracted a good deal of attention among farmers and causes much favorable comment. It looks to be true to its name, "IMPERISHABLE". It is, in my judgement, the coming silo.

Yours very truly,
B. P. COGSWELL,
Farm Manager.

THE SILO FOR NEW YORK FARMERS

NATCO IMPERISHABLE SILO

(patented)

Here's the new type of silo—the silo that has raised the standard of quality of ensilage for feeding. The silo whose walls are moistureproof and air-tight and consequently keep ensilage from becoming sour, moldy or rotten.

THE NATCO IMPERISHABLE SILO is built of hollow vitrified-clay blocks, reinforced by two continuous steel bands between each layer of blocks. There are no staves to warp, shrink or split. No hoops to tighten. No continual repair bills. Never needs painting. The Natco Imperishable Silo is

Weatherproof

Decayproof

Fireproof

It will last a lifetime and the first cost is practically the last cost. It can be erected by any mason as easily as a carpenter builds the old type of silo. When completed you have a very attractive as well as an efficient and durable silo added to your permanent farm building assets.

WRITE FOR FREE SILO BOOK

We have an attractively illustrated book which we will be glad to send free to Cornell men or to any farmer interested in keeping ensilage fresh, sweet and succulent. Write for a copy now and names of owners of Natco Imperishable Silos in your locality.

NATIONAL FIRE PROOFING COMPANY
SYRACUSE NEW YORK

Every Dollar Comes Back



High time for you to plan on getting a larger return from your 1914 corn crop and labor by ordering a UNADILLA SILO forthwith. Discount given on April and May delivery orders. With nutritious, succulent silage in the daily ration, winter or summer, you dispense with the expense of half the hay and mill feed. This saving, plus the value of the increased milk yield, will equal cost of a UNADILLA the first year. Do you know of a surer way to make your money return a

100 PER CENT. DIVIDEND?

A copy of our catalogue mailed gratis to anyone contemplating the purchase of a silo this season. Illustrates those features which have given the UNADILLA a national reputation for being the best built and most convenient silo in use.

Photo shows the twin 14 x 32 white pine UNADILLAS which have doubled the feeding value of the corn crop on the Geo. P. Miller farm at Lewisburg, Pa.

UNADILLA SILO CO.
BOX 22 UNADILLA, N. Y.



The chick that counts is the chick that lives. H-O Steam-Cooked Chick Feed will help the little ones because of its splendid balance and because of the steam-cooking which opens up the grain cells, making it easy for the little chicks to digest it.

Every bag is tagged with a guaranteed analysis.

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Poultry Feed

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MILLS

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The Improved Simplex Link Blade Cream Separator

LIGHTEST RUNNING

LARGEST CAPACITIES

CLOSEST SKIMMING

The Only Practical Large Capacity Separators

Has more exclusive patented features of merit than all others—Has all the desirable points that can be put into a cream separator.

500 lbs., \$75.00

900 lbs., \$90.00

700 lbs., 80.00

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Manufacturers of Creamery, Dairy and Cheese Factory Apparatus

Also "B-L-K" COW MILKERS

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Registered
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Chemist

I'll Feed Your Stock 60 Days Before You Pay



I want the privilege of sending a 60-day supply of Sal-Vet (my famous worm-destroyer and conditioner) to every man who owns sheep, hogs, cattle, horses or mules. I want you to see for yourself how it rids all farm stock of the deadly stomach and free intestinal worms—how it will stop your losses from worms and solve your stock-raising problems—how it will make your stock thrive better—keep healthy and free from disease. In making this offer I don't ask one penny from you, now or at any other time, unless Sal-Vet does all I claim.

Worms rob you of your stock-profits—keep your animals thin and out of condition—steal their food—sap their strength and vitality and make them easy victims of disease. I'll rid your stock of these pests. I'll prove it before you pay.



Antoni, Nebraska.
I have just shipped a carload of hogs that went within a week of topping the market. These hogs were on Sal-Vet. Most of my neighbors lost their entire herds from disease. O'Leary, Ill.

READ THESE LETTERS

A short time after beginning to use Sal-Vet on a large number of hogs, I noticed that the worms had been cleaned the worms from these animals and at once they commenced to eat better, and to thrive accordingly. There were cases of worms on hogs and consider this Sal-Vet was our salvation.

(Signed) D. E. C. LONG & SONS.
Most of my neighbors lost their entire herds from disease. O'Leary, Ill.

Send No Money—Just the Coupon
Tell me how many head of stock you have. I'll ship enough Sal-Vet to last 60 days. You simply pay the freight charge when it arrives, and within the 60 days are up report results. If it does not prove me a cent.

Prices: 40 lbs. \$2.35; 100 lbs. \$5.00; 250 lbs. \$9.00; 500 lbs. \$13.00; 1000 lbs. \$25.00. Sal-Vet is sold in 40 lb. casks, 100 lb. casks, 250 lb. casks, 500 lb. casks, 1000 lb. casks. Sal-Vet is sold in 40 lb. casks, 100 lb. casks, 250 lb. casks, 500 lb. casks, 1000 lb. casks. Sal-Vet is sold in 40 lb. casks, 100 lb. casks, 250 lb. casks, 500 lb. casks, 1000 lb. casks. Sal-Vet is sold in 40 lb. casks, 100 lb. casks, 250 lb. casks, 500 lb. casks, 1000 lb. casks.

THE S. R. FEL CO., Dept. CC
Cleveland, O.

SIDNEY R. FEL, Pres.
Name _____
Address _____
City _____ State _____
No. _____
Shipping \$_____
No. _____
Cattle _____
Horse _____
4-14

FORMER STUDENTS

(Continued from page 256)

'00, B.S.A.—On February 11th, Louis F. Boyle was married to Miss Anna R. Egbert, '10, Brigham Young University. Boyle sold his interests in the Inter-Mountain Industrial Association, and is now operating the largest specialized potato farm in Utah at Lewiston. Last year his yield was a little over fifteen thousand bushels. His farm adjoins that of Mr. A. L. Hyer, whose son, Merle, is the champion boy potato raiser of the United States. In addition to his farm work, Boyle acts as a consulting agricultural specialist for the American Smelting & Refining Co., of Salt Lake City.

'11, B.S.A.—Floyd W. Bell was married last September to Miss Mildred Dudley of Ithaca. Bell is teaching Animal Husbandry at the A. & M. College at College Station, Texas.

'11, B.S.A.—We wish to correct an error in the February issue which stated that W. O. Strong was of the class of '07. Strong graduated in 1911 and in October, 1912, married Miss Dunn who graduated in 1912, B.S. Part of Mrs. Strong's letter is well worth repetition, "We have a large farm here (Grove, Va.), of 8100 acres and our days are busy. We have the field ready for 90 acres of potatoes. A part of the farm is woods and marsh but the farm land lies flat and is in good large fields. The James River bounds us on the South for two miles or more. Our help is mostly colored but we are getting in some white men. We run a commissary in connection with the farm because we have so many people on the farm. We are near Yorktown, Jamestown, and Richmond, all historic places. The second oldest college in the United States, William & Mary, is in Williamsburg, three miles through the woods.

"Our Virginia needs more money and more energetic, ambitious men. There are a few northerners and westerners here and more coming in to clear the land, and some day, as Dean Bailey says, this may be the "garden spot of America." We have cleaned and cleared and repaired and built so that

King's Mill is a different farm than two years ago. We shipped 15 carloads of potatoes last year from 51 acres and want to do better this year. We have put up four silos and are feeding beef cattle this winter. Hogs will play a large part in our future plans."

'12, B.S.A.—W. H. Hook is now situated at Ridgely, Maryland, where he has charge of an agricultural high school and experimental farm. He is conducting experiments with such local crops as strawberries, tomatoes, soy beans, factory peas, sugar corn, field corn, and similar crops.

'13, B.S.—Miss Mary B. Crossman is teaching science at Glen Eden, a private school for girls, in Poughkeepsie, N. Y.

'15, B.S.—W. C. Stokoe is back in New York State after several months of farm and other experiences in Ohio and Wisconsin. He is now employed by the city of Buffalo as farm manager for the farm run in connection with the J. N. Adams Memorial Hospital.

'13, B.S.—Miss Dorothy W. Bustard may be addressed at 662 Washington St., Brookline, Mass.

'13, B.S.—Miss Rebeckah Gibbons is teaching domestic science at Marion College, Marion, Virginia.

'13, B.S.—Miss Cecilia Agnes McKay is teaching domestic science at the Syracuse State Institution which is located at Syracuse, N. Y.

Ex. '14—Daniel E. Smith, who until recently was in Colorado, may now be addressed at 4 Park Place, Saranac Lake, N. Y.

'14, B.S.—Miss G. C. Bristol, who graduated in February is manager of the Dryden Road Cafeteria.

'14, B.S.—Miss Bertha Betts has announced her engagement to Mr. J. H. Reisner of the Department of Farm Crops.

Send 10c for three months' trial subscription to
"Cleanings in Bee Culture"

the standard bee journal of the United States for forty years. Full of profit-making suggestions. FREE book on "Bee Supplies" with every order. Send coin in envelope at our risk. Offer is for limited time only.

THE A. I. ROOT CO., Box 26, Medina, Ohio

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Three D Grains is our brand for the highest and best grades of Distillers' Dried Grains sold in this country. Three D Grains are classified according to analysis and sold at prices commensurate with their feed value.

OUR GUARANTEES:	PROTEIN	FAT	FIBRE	CARBOHYDRATES
Eagle Three D Grains	- - 30-38%	10-15%	8-13%	30-40%
Corn " "	- - 26-33	9-14	8-13	30-40
Bourbon " "	- - 24-28	8-11	9-14	40-50
Queen " "	- - 18-26	4-9	8-15	35-45

The leading dairymen feed Three D Grains to their cows. Read what some of them say:

Pontiac Pet broke the world's record in the spring of 1911 by producing 37.67 lbs. butter in 7 days. Her owner, E. H. Doller, of Heuvelton, N. Y., had bought a car of Three D Grains. We asked him if it had been used in this test. He answered saying: "Twenty-five per cent. of grain ration was Corn Three D Grains."

L. P. Bailey, Pres. Ohio Dairymen's Ass'n. and breeder of Jersey cattle, Tacoma, Ohio, wrote in 1907, "I have used Distillers Dried Grains quite extensively for several years. I consider them excellent feed for dairy cows, in fact the cheapest source to get protein." Mr. Bailey has been feeding Three D Grains for over twelve years.

Write us for circular giving directions for feeding Three D Grains, also for prices if your dealer does not keep it.

The Dewey Bros. Co., Box 577, Blanchester, O.

Use Chr. Hansen's RENNET TABLETS

AND CHEESE COLOR TABLETS

For Cheese Making on the Farm

Also try our **DANISH BUTTER COLOR**. It gives that beautiful golden June shade and does not affect the faintest aroma or flavor in the butter.

CHR. HANSEN'S RENNET EXTRACT, CHEESE COLOR AND LACTIC FERMENT CULTURE

Have Stood the Test of Time.

Chr. Hansen's Laboratory
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A NEW STANDARD FOR

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If you want to increase the selling power of your next catalogue, if you want to make your advertising as effective as possible, you should look into the question of using color reproductions. Our success lies, not alone in the making of proper plates, but in printing them as they should be. Our product is used by companies of international reputation. We shall be pleased to submit estimates or samples of work.

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FANCY MILK

The prize winners of fancy milk contests invariably attribute their success in no small measure to the aid of



Also in butter exhibitions, the contestants who are able to develop to a high degree that peculiar grain, flavor and odor so easily associated with butter made from clean, pure cream, always speak their appreciation for Wyandotte Dairyman's Cleaner and Cleanser.

Clean milk and clean cream need protection and that is the express purpose of Wyandotte Dairyman's Cleaner and Cleanser. It is made a perfect cleaner, also a sanitary cleaner.

Without either fats, grease, caustic or any of the common properties of ordinary agents, it does what none of them can do in cleansing, sweetening and purifying.



For this reason Dairy College Authorities and milk Inspectors recommend only Wyandotte Dairyman's Cleaner and Cleanser. Why not ask your dealer or write your dairy supply house.

THE J. B. FORD CO., Sole Manufacturers
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This Cleaner has been awarded the highest prize wherever exhibited.

Wing's Quality Seeds

Are known everywhere. Our ALFALFA is famous for its purity and quality. We sell nothing but the best AMERICAN-GROWN seeds; this season we offer stocks from Kansas, Nebraska and Dakota, also Grimm Alfalfa.

CORN, SOY BEANS

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VETCH and MELILOTUS

The Great Soil Restorer

Full line of FIELD, GARDEN and FLOWER SEEDS.

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Box C

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A PROBLEM SOLVED WITH EFFICIENCY

Have you money invested in producing prize stock, certified milk, or getting the best results possible from cattle and horses?



THE KENT VACUUM GROOMER solves the cleaning problem. Animals do better; employees take greater interest, and cleaning of stock is done more sanitarily, and with less wear and tear by its use.

ADAPTED to all kinds of power

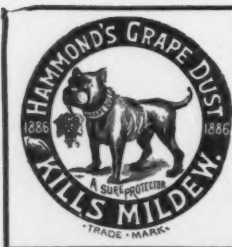
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Incorporated

111 South Washington Street
ROME, NEW YORK



Also manufacturers of THE KENT STATIONARY VACUUM CLEANER.



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Used effectively to kill Mildews
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Sold by the Seed Dealers.
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It Pays to Clip Horses and Cows

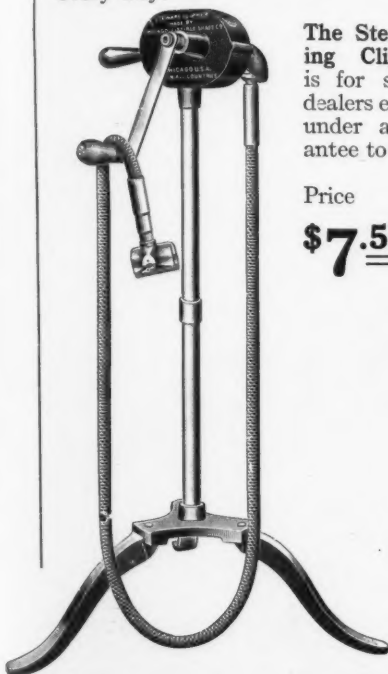
Clipped horses are healthier and render better service. When the heavy coat that holds the wet sweat and dirt is removed they are more easily kept clean, look better, get more good from their feed and are better in every way.



The Stewart Ball Bearing Clipping Machine is for sale by leading dealers everywhere. Sold under a positive guarantee to please.

Price

\$7.50



Why Cows should be Clipped

The campaign to prevent disease and infant mortality from impure milk is rapidly spreading to every city in the land and regulations are being enforced that require the observance of every sanitary precaution in the care of cows.

Cleansing the udders and flanks before milking to prevent filth from dropping into the milk is a pertinent necessity that cannot be properly done unless the hair on these parts is kept short by clipping every three or four weeks.

The Stewart No. 1 Ball Bearing Clipping Machine makes this a simple task that requires less than five minutes time per cow.

No owner of cows can afford to be without one of these machines. (Clips horses and mules equally well with same equipment.)

Write for complete new catalogue showing our line of clipping and shearing machines.

Chicago Flexible Shaft Co. 127 LA SALLE AVENUE CHICAGO, U. S. A.

In writing to advertisers please mention THE CORNELL COUNTRYMAN

INVESTIGATION IN PLANT PHYSIOLOGY

(Continued from page 239)

the plant came from the soil. With the discovery of the phenomenon of photosynthesis in the plant the views went to the other extreme. Many recent investigations, however, point to the use of organic nitrogen, a few to direct assimilation of sugar. Our experiments indicate that sugar may be absorbed and utilized from the medium in which the plant is growing. It is necessary to conduct all such experiments under absolutely sterile conditions, as the presence of micro-organisms would result in transformation of the organic substance offered. It is entirely probable that the beneficial influence of manuring is due in part to the increase of directly available organic substances.

SEED STERILIZATION

As indicated, studies of the above type are only possible when conditions of growth can be maintained absolutely free from micro-organisms. The method of seed sterilization used gives promise of being applicable practically for the prevention of those plant diseases transmitted by diseased seed. A large number of seeds have been successfully treated. In fact no seeds have yet been employed which do not withstand the treatment.

OTHER PROBLEMS

Other problems have been or are in the course of investigation. Those of an economic interest and to which attention has been devoted are: (1) A study of the red pigment in tomato and factors influencing its formation. Light is not essential and temperature above 30° C is detrimental and may only permit formation of the yellow color. Immature fruit will color and has better keeping qualities than vine ripened fruit though the culinary quality is poorer. (2) A study of respiration in fruits with reference to ventilation and fruit storage. The practical deduction is that good ventilation in conjunction with refrigeration is important. (3) Investigations on pro-

longing the keeping of cut flowers. (4) Investigation on the rest period in plants. (5) Factors influencing the rooting of cuttings. (6) Growth and metabolism in apple trees.

Much attention has been given also to other problems of fundamental importance but of less practical and general interest.

NATIONAL QUARANTINE LAW

(Continued from page 232)

The fear has been often expressed that the power of regulating the entire business of importing plants will, under this law, be assumed by some one man who may prove arbitrary in the exercise of his powers. In the first place, the personnel of the Horticultural Board would of itself prevent any one man from assuming arbitrary power in carrying out the provisions of the law. In the second place, all inspection of nursery stock in this country is made in the different states by state officials and does not, therefore, come under the Federal authorities at all. The Department of Agriculture simply serves as an information bureau to gather information concerning the packages of nursery stock imported into this country and to report the same to the state inspectors. There is no reason to expect that the Department of Agriculture on the one hand will become an unfair partisan of any one interest, or on the other hand an enemy of any particular agricultural industry.

TIME TO ORDER FRUIT TREES

Spring is here; planting should be started right away.

If you have not sent your order, better do it right now.

READY TO SHIP AT ONCE.

I can get your trees on the road in a day or two after I have your order.

Send for my new catalogue; it is a book you need whether you plant a hundred or a thousand trees.

SAMUEL FRASER, Nurseryman,

Box 92 GENESEO, N. Y.

PLANT THIS SPRINGORDER NOW

Hardy Pomeroy English Walnut Trees

Obtainable **ONLY** through Pomeroy growers, other nurseries can not and do not fill orders with our **HARDY POMEROY ENGLISH WALNUT TREES**. To insure results obtain trees of us. You can have beautiful productive shade trees and orchards in zero climate. Their dormant condition permits transplanting through May, usually.

BOOKLET of illustrated facts desired sent free.

Mail Postal Now.

DANIEL N. POMEROY & SON

—English Walnut Orchards—

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There is a difference between fruit growing and forestry

yet most of the directions for fruit growing are directions for producing rapid wood growth only.

This means coming into bearing late and irregular bearing on account of lack of enough available mineral plant food to raise a crop of fruit and to set strong fruit buds in the same season.

POTASH

Two years before the trees are expected to come into bearing the annual application of minerals should begin, using 50 to 100 pounds Muriate of Potash and 100 to 200 pounds of bone, acid phosphate or basic slag per acre.

Potash improves the flavor, shipping quality and keeping power as well as the yield of fruits.

Write us for Potash prices and for free books with formulas and directions.

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PAYS**

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YOU needn't fear a visit from the Sealer of Weights and Measures if you use **Thatcher Milk Bottles.**
 You won't give over-capacity either, because they are **accurate!** Send for our **free** book. It tells exactly why Thatcher bottles add to your profits.

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SAFETY

Had you any trouble with the **MARCH WIND** coming through crack or crevice in the Greenhouse?

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Old English



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SEMI-LIQUID

and ELASTIC

Will stop the trouble. Put up in 16 pound cans; 50 and 80 pound buckets.

Hammond's Greenhouse White,

A **SUPERB PAINT**, with years' record to back it up, for wear and tear and looks on either wood or Iron Greenhouses. It stays where you put it. In 5, 10, 15, 20, 25, or 30 Gallons.

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KOHN & BRUNNE

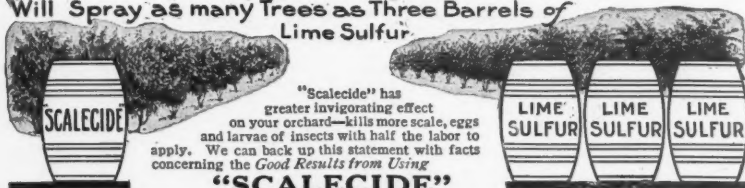
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Will Spray as many Trees as Three Barrels of
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"Scalecide" has greater invigorating effect on your orchard—kills more scale, eggs and larvae of insects with half the labor to apply. We can back up this statement with facts concerning the *Good Results from Using*

"SCALECID"

Send for our illustrated booklet—"Proof of The Pudding". Tells how "Scalecide" will positively destroy San Jose and Cottony Maple Scale, Pear Psylla, Leaf Roller, etc., without injury to the trees. Write today for this FREE book and also our booklet—"Spraying Simplified".

Our Service Department can furnish everything you need for the orchard at prices which save you money. Tell us your needs.

We are World Distributors for VREELAND'S "ELECTRO" SPRAY CHEMICALS and Arsenate of Lead Powder (33 per cent), which, used wet or dry, has no equal in strength or texture. Avoid imitations. B. G. PRATT CO., Mfg Chemists 50 Church Street, New York City

Spray your FRUIT TREES with

HEMINGWAY'S LEAD ARSENATE

HIGH ANALYSIS

EASY TO MIX

STAYS IN SUSPENSION

Spray or Dust your POTATO-PLANTS and GRAPE VINES with

HEMINGWAY'S "CAASCU"

Pronounced "K. S. Q."

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The Ideal Arsenate of Lead for the Fruit Grower. The Best Poison for
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MILK DAIRYMEN IS THE

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DRIED GROUND ODORLESS

To insure increased Garden Crops—larger and brighter Flowers and a rich green Lawn, give your soil a heavy coating of Dried Ground Horse Manure. No weed seeds, no refuse—it becomes part of the soil.

Plant food is immediately available and lasting. Your planting will be successful when you use Well Rotted Horse Manure. Put up in bags 100 lbs. each.

Write for circular and prices.

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This Book Mailed Free

40 pages of practical information, written in a way you can understand and use. Gives spray calendar, spray formulas. Describes which mixtures to use to fight any certain pests on apple and other fruit trees, bush fruits, grapes, vegetable crops, etc. Tells how to prepare stock solutions, how to apply, which type of sprayer to use. Shows most practical sprayers, both hand and power. Get this valuable Free Book today.



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RELIABLE
SPRAYERS**



are made of chemical-proof materials. Designed to furnish best service with great saving of solution. Easy to operate and to clean. More efficient and more economical than cheap outfits which last but a season or two. In use by over 400,000 fruit growers and gardeners. Sold under a binding guarantee of satisfaction. Send for the book and post yourself at once. [22]



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Largest Makers of Pumps
for Every Purpose
16 W. Fall St., Seneca Falls, N. Y.



Pyrene Fire Extinguishers

are being used on the farm, in the home, in hotels,
factories, motorboats and automobiles.

They are the best because

THEY ARE THE MOST EFFICIENT
THEY ARE SMALL
THEY ARE EASILY OPERATED
THEY ARE REASONABLE IN PRICE

DAVIS-BROWN ELECTRIC CO.

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115-117 So. Cayuga St.

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We can find that farm for you

We have probably the largest list to select from in Central New York State.

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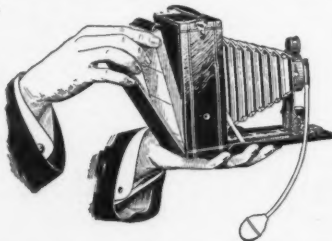
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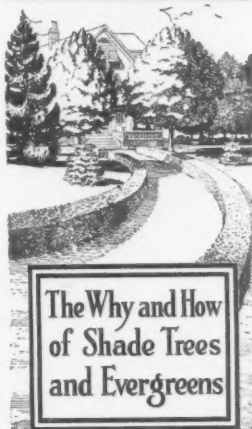
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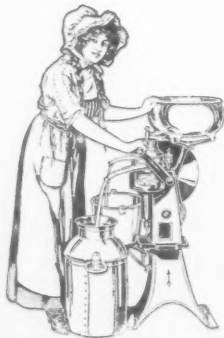


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